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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/748,365	12/30/2003	Kyung-Ju Choi	ZM921/05025	7814
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JOHN F. SALAZAR MIDDLETON & REUTLINGER 2500 BROWN & WILLIAMSON TOWER LOUISVILLE, KY 40202			EXAMINER DRODGE, JOSEPH W	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/748,365

Applicant(s)

CHOI, KYUNG-JU

Examiner

Joseph W. Drodge

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 36-64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 36-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 36-39, 43-47 and 59-64 remain rejected under 35 U.S.C. 103 as being unpatentable over Muller et al patent 4,954,255 in view of Kahler patent 5,888,262 (both of record).

Regarding independent claims 36, 62 and 64, Muller discloses a pleated fluid filter arrangement comprising: at least one layer of flanks of filter media (#22, 5) pleated into a plurality of longitudinally extending adjacent opposed successive pleat flanks (or face crests) of selected depth (*having sharp-nonwavy face crests, planar flanks and, in contrast, rounded small areas of curvature or waviness of pleat edges (column 5, lines 29-32), opposite the crests. Spacers 6 or 11/12, of material increments which are of a form that is dimensionally stable and hence of selected length (column 5, lines 59-60)*), provide spacing between successive pleat flanks (or face crests) 5 to provide spaced upstream and downstream filter face crests. The pleat flanks 5 are substantially planar, and *form flank planes*. In the embodiment of figure 9, the spacers are in the form of facing increments that are nestled against the filter media surfaces (column 5, lines 9-20 and column 6, lines 44-58).

The top or fold edges, crests, of the pleat flanks together form a substantially single planar surface, the facing increments being adhered to the planar surfaces at points which are spaced from the pleat crests. The material increments are applied to the flank planes 5, and extend adjacently and centrally oriented with respect to an upstream-facing and downstream-facing flank plane (figures 2 and 6).

Regarding Claim 38, Muller discloses the communicatively facing increments of the spaced formed material increments being of selected thickness so that the distance between adjacent successive pleat planks and between the spaced upstream and downstream filter face crests is substantially equal (Figs. 2a-5d and especially figure 6).

Regarding Claim 39, Muller discloses the adjacent successive pleat flanks being of a substantially uniform level geometric configuration (Figs. 2a-5d).

Regarding Claim 37, Kahler also teaches the increments of the spaced formed material increments being selected from a suitable fluid pliable adhesive (Col. 8, Lines 33-36). It would have been also obvious to one of ordinary skill in the art to have applied adhesive to the spacers of Muller, in view of van Rossen or Kahler, to more permanently secure the spacers to the flanks and thus resist filter deformation in use due to applied fluid pressures.

The claims 36-63 all differ from Muller in requiring that the increments of spacers comprising *adhesive* facing material increment pairs, which are engaging and have a common longitudinal axis, which are substantially aligned along the layer of filter media. *The pair of engaging, adhesive increments are required to be associated with both the 1st and 2nd side of the successive pleat flanks.* However, Kahler teaches engaging pairs of increments of spacers (see for instance pairs of increments of spacing material 13 in figures 4a, 4b, 5a and 5b, column

8, line 21-column 9, line 22). *Kahler further teaches pairs of engaging, adhesive increments 16.2 in the embodiment of figure 4c, engaging pairs increments on both 1st and 2nd side of each successive pleat flank in the embodiment of figure 5c and centrally oriented adhesive increments in the embodiment of figure 2c (also see discussion at column 7, lines 20-30; column 8, lines 50-57 and column 9, lines 5-22). Column 10, line 64-column 11, line 2 suggest combining features of the various embodiments depicted in the diverse figures. It would have been obvious to one of ordinary skill in the art to have modified the manufacture of the spacer increments of Muller, such that they form pairs of engaging increments, as in Kahler, in order to further strengthen, and support the crests and pleats of the filter material. Kahler relates to either air or liquid filtration (column 1, lines 14-18). *It would have also been obvious to have utilized the pairs of engaging, adhesive increments of Kahler to increase the compressive and tensile strength of the pleat flanks along with resistance to deformation over long periods of time.**

Modification of Muller in view of Kahler yields pleat flanks having a 1st primary single plane complemented with embossment portions having additional single planes.

Claims 43-46 also differ from Muller in requiring the the communicatively facing increments of spacers to have differing cross-sections, lengths, or cross-section breadths (claims 43,45 and 46), or be overlapping (claim 44),

Regarding Claim 43, Kahler teaches that the communicatively facing increments being in the form of substantially similar length increment first and second sets with at least one of the sets having a substantially uniform cross-section with at least one certain select increment of the other set being of differing cross-section wherein at least one certain pair of communicatively

facing increment is tapered to provide tapered spacing and a overall geometric configuration conducive to a select geometric configuration (Figs. 5a-5d).

Regarding Claim 44, Kahler teaches the communicatively facing formed material increments being in increment first and second sets with at least selected increments of at least one set overlapping with respect to selected pleat crests of the other set (Fig. 5d, material 16.1b' also functioning as spacing material).

Regarding Claim 45, Kahler teaches the communicatively facing formed material increments being in formed material increment first and second sets with at least selected formed material increments of one set differing in length from at least one of the lengths of other formed material increments in the sets (see especially Figs. 5c,5d).

Regarding Claim 46, Kahler teaches that the communicatively facing formed material increments being in formed material increment first and second sets with at least one of the selected formed material increments of one set differing in cross-sectional breadth from a cross-sectional breadth of at least one of the other formed material increment of the other set (Figs 5a-5d).

It would have been obvious to have manufactured the spacers of Muller to have differing cross-sections, lengths, or cross-section breadths (claims 43,45 and 46), or be overlapping (claim 44), as taught by Kahler, so as to more evenly distribute fluid flow across the entire extent of the pleat flanks of the filter segments and mitigate uneven particle accumulations.

Regarding Claim 47, Muller does not disclose the communicatively facing formed material increments being pressure displaced increments (claim 47) or formed in a pleating zone with a back and forth reciprocating motion of a reciprocating mechanism. Determination of

patentability in "product by process" claims is based on product itself. In re Thorpe, 227 USDQ 964 (1985). The increment formation process of Muller is deemed to form a pleated filtering structure by a process with is an equivalent alternative to the claimed pressure displacement process or reciprocating mechanism process, with no commensurate difference in end product.

For claim 63, the engaging increments of Kahler are aligned and perpendicular to an arbitrary lines extending horizontally along the faces of the planar material. The term "score line" apparently refers to a method of manufacture of the filter pleats, and hence is of little patentable weight.

Claims 40-42, 48, 50-52, and 54-56 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Kahler as applied to claims 36-39 and further in view of Enborn or van Rossen and also in view of Cusick et al U.S. Patent No. 5,993,501 (all of record).

Regarding Claims 40 and 50, Enborn teaches a pleated filter with spacers and also teaches a support layer (#6) but does not disclose the material of the filter media. Van Rossen teaches a pleated filter of substantially planar, un-wavy features, with the filter media consisting of a support material layer and filter material layer that may be of fabric (see especially Abstract, column 6, lines 3-47). Cusick teaches a pleated fluid filter comprising at least one layer of selected scrim material (#24, 26) serving as a support layer and a selected fine synthetic (Col. 2, Lines 48-60) filter media material (#22) applied to the selected scrim material. It would have been obvious to one of ordinary skill in the art to further modify Muller with the support element of Enborn or van Rossen and also in view of Cusick, in order to maintain the shape of the filter layer against applied fluid pressures occurring during filtering operation and maintain high

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stability and shape, synthetic support layer materials being common in the filter art, with various materials being taught in columns 6-7 of van Rossen.

Regarding Claim 41, Cusick discloses that the scrim material is in the range of approximately forty to two hundred grams per square meter in basic weight (Col. 8, Lines 7-18) but does not disclose the fiber size, or stiffness of the scrim material. One of skill in the art would by routine experimentation find the optimum fiber size, and stiffness. It would have been obvious to one of skill in the art to make the fiber size, and stiffness of the scrim of Muller in view of Cusick as so desired or required, including as claimed to optimize filtration.

Regarding Claim 42, Cusick discloses that the scrim material includes with a selected hot melt spray (Col. 5, Lines 20-24) of adhesive amorphous material (Col. 6, Lines 28-52) and the filter media material is of a relatively estimated selected weight, fiber, thickness and porosity (Col. 5, Lines 12-20) when applied to the hot melt spray coating.

Regarding Claim 48, Cusick discloses that at least one layer of filter media is of synthetic fibrous material (Col. 2, Lines 48-60).

Regarding Claim 50, Cusick discloses that at least one selected scrim layer has been fed to a forming zone as a downstream support layer and a selected fine synthetic filter media material has been applied thereto (Col. 11, Lines 45-52).

Regarding Claim 51, Cusick discloses that downstream support layer includes synthetic material (Col. 7, Line 54 – Col. 8, Line 18).

Regarding Claim 52, Cusick discloses that the downstream support layer is of wet-laid material (Col. 8, Lines 7-13).

Regarding Claim 54, Muller in view of Kahler and Cusick does not disclose that the downstream support layer is of dri-laid material. Determination of patentability in "product by process" claims is based on product itself. In re Thorpe, 227 USDQ 964 (1985). The support layer forming method of Kahler in view of Cusick is deemed to be a structure alternative to the dri-laid process.

Regarding Claim 55, Cusick discloses that the downstream support layer is of spunbond material (Col. 8, Lines 7-13).

Regarding Claim 56, Cusick discloses that the selected fine synthetic filter media is of meltblown material (Col. 6, Lines 5-9).

Claim 64 differs from Miller in requiring a pair of successive pleat flanks being separated by at least one adhesive spacer on one side of the filter media and free of spacers on the downstream side thereof. Kahler also teaches flanks of pleated filter media with such arrangement of adhesive spacers (figures 1c, 4c [adhesive spacer increments 16.2"] and discussion at column 7, lines 50-57. ***It would have also been obvious to have utilized the pairs of engaging, adhesive increments of Kahler to increase the compressive and tensile strength of the pleat flanks along with resistance to deformation over long periods of time; and to have applied the adhesive spacers in such manner so as to allow simplified manufacturing techniques and less amounts of necessary added material.***

Modification of Muller in view of Kahler yields pleat flanks having a 1st primary single plane complemented with embossment portions having additional single planes.

Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Kahler, Enborn and van Rossen and also in view of Cusick et al as applied to Claim 48 above, and further in view of Niccum et al., U.S. Patent No. 3,849,314 (all of record).

Regarding Claim 49, Muller in view of Enborn and Cusick does not disclose that the filter media is of cellulose material. Niccum teaches a pleated fluid filter comprising a cellulose filter media (Col. 2, Lines 53-56). It would have been obvious to one of ordinary skill in the art to modify Muller in view of Cusick with the element of Niccum because it is a material of manufacture common in the filter art.

Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Kahler, Enborn and Cusick as applied to Claim 50 above, and further in view of Osendorf, U.S. Patent No. 5,427,597.

Regarding Claim 53, Muller in view of Kahler, Enborn and Cusick does not disclose that the downstream support layer is of cellulose material. Osendorf teaches a pleated fluid filter comprising a cellulose support layer (Col. 3, Lines 1-3). It would have been obvious to one of ordinary skill in the art to modify Muller in view of Cusick with the element of Osendorf because it is a material of manufacture common in the filter art.

Claims 57-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Kahler, Enborn and Cusick as applied to Claim 56 above, and further in view of Kenigsberg et al., U.S. Patent No. 5,156,780. Regarding Claims 57-58, Muller in view of Kahler and Cusick does not disclose an additive being added to the filter media. Kenigsberg teaches a process for adding a fluoro-chemical to a porous media (Col. 4, Lines 33-38). It would have been obvious to one of ordinary skill in the art to modify Muller with the element of Kenigsberg in order to achieve permanent water and oil repellency while maintaining the porosity of the filter (Col. 3, Lines 52-54).

Applicant's arguments filed on September 08, 2008 have been fully considered but they are not persuasive.

It has been argued that Kahler and Muller fail to teach pairs of adhesive spacer increments on either one or both sides of the filter pleat flanks. It is submitted that numerous embodiments of Kahler teach such adhesive spacer increments on one or both sides of the pleat flanks. Claim language does not preclude such adhesive spacer increments being utilized in combination with pleat flank embossment or raised portion spacers.

It is also asserted that Kahler fails to show pleat flanks having a single plane, since the raised embossment spacer increments provide multiple planes. Claim language regarding "single plane" is open-ended. Modification of Muller in view of Kahler yields pleat flanks having a 1st primary single plane complemented with embossment portions having additional single planes.

Apparently, with respect to new claim 64, it is argued that Kahler requires spacer material on both sides of the pleat flanks. It is submitted that Kahler has an embodiment with only one side of the pleat flanks having adhesive spacer.

Arguments are also presented concerning relative thickness of adhesive, or relative plurality of adhesive spacer material increments. It is submitted that neither the claims, Miller or Kahler recite particular dimensions of adhesive material or preclude there being any given plurality of adhesive spacer increments.

For claim 64, it is argued that the claim requires pleat flanks that are embossment-free, so that Kahler teaches away from such provision. For claim 64, Kahler is only used to modify Miller by allowing adhesive spacers to be on either side of the pleat flanks, and not necessarily on the downstream side as in Miller.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at telephone number 571-272-1140. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Roy Sample, can be reached at 571-272-1376. The fax phone number for the examining group where this application is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from

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the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either private PAIR or Public PAIR, and through Private PAIR only for unpublished applications. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWD

10/31/2008

/Joseph W. Drodge/

Primary Examiner, Art Unit 1797

Application Number**Application/Control No.**

10/748,365

**Applicant(s)/Patent under
Reexamination**

CHOI, KYUNG-JU

Examiner

Joseph W. Drodge

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